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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/617,552	07/10/2003	Hsin-Pang Wang	133979-1	4302

7590 11/17/2004

General Electric Company
CRD Patent Docket Rm 4A59
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EXAMINER	
LIN, ING HOUR	

ART UNIT	PAPER NUMBER
1725	

DATE MAILED: 11/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/617,552	WANG ET AL.	
	Examiner	Art Unit	
	Ing-Hour Lin	1725	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 September 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 29-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Whalen et al in view of either Klug et al or Cooper et al.

Whalen et al (col. 4, EXAMPLE 1, lines 15+) teach the claimed die (a RP mold in Fig. 3) for making a casting core (ceramic turbine blade), comprising a single piece structure comprising at least one cavity (see Figs. 1-2), wherein the said structure comprises a material including epoxy or silicone (fugitive polymer (col. 3, lines 24+) and can be selectively removed from the

core by heating or chemical dissolution; and the structure is assembled in additive layers (slices) by stereolithographic process.

Whalen et al fail to teach the use of a particular configuration for the cavity. However, either Klug et al (col. 4, lines 44+) or Cooper et al (col. 9, lines 7+) teach the use of the particular configuration for the cavity for the purpose of effectively forming cooling channels within a shell-molded turbine engine blade.

It would have been obvious to one having ordinary skill in the art to provide Whalen et al the use of the particular configuration for the cavity as taught by either Klug et al (col. 4, lines 44+) or Cooper et al (col. 9, lines 7+) in order to effectively form cooling channels within a shell-molded turbine engine blade.

4. Claims 1-3, 5-20, 22-24 and 27-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Woodrum et al in view of Whalen et al.

Woodrum et al (col. 2, lines 31+) teach the claimed method for investment casting a component including one of a vane and a blade in a turbine assembly, comprising making a multi-wall ceramic core, wherein a fugitive pattern (col. 2, lines 59+) is assembled in additive layers (slices) by lithographic process having multiple thin wall pattern elements providing internal wall-forming spaces of a final core for forming space-apart relationship with external investment wall in order to form internal cooling passage including turbulators (col. 3, lines 13+), the pattern is placed in a core molding die cavity having a core configuration, an alumina based ceramic slurry is injected molded into the die cavity about the pattern and the between the pattern elements to form a ceramic core, and the core is removed form the core to provide a

multi-wall green core. The green core then is fired or cured to develop core strength for casting and used to form an investment mold for casting an airfoil.

Woodrum et al fail to teach the use of a single piece sacrificial die. However, Whalen et al (col. 4, EXAMPLE 1, lines 15+) teach the claimed die (a RP mold in Fig. 3) comprising at least one cavity (see Figs. 1-2) for the purpose of effectively molding a ceramic core, wherein the said structure comprises a material including epoxy or silicone (fugitive polymer (col. 3, lines 24+) and can be selectively removed from molding a ceramic core by heating or chemical dissolution and the die is assembled in additive layers (slices) by lithographic process.

It would have been obvious to one having ordinary skill in the art to provide Woodrum et al the use of a single piece sacrificial die as taught by Whalen et al in order to effectively mold a ceramic core.

5. Claims 4 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Woodrum et al in view of Whalen et al and further in view of Zoia et al.

Woodrum et al in view of Whalen et al fails to teach the use of laser sintering or laser deposition. However, Zoia et al (col. 4, lines 66+) teach the use of laser sintering or laser deposition for the purpose of effectively adding layers with high strength in making the single piece sacrificial die. It would have been obvious to one having ordinary skill in the art to provide Woodrum et al in view of Whalen et laser sintering or laser deposition as taught by Zoia et al in order to add layers with high strength in making the single piece sacrificial die.

6. Claims 25-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Woodrum et al in view of Whalen et al and further in view of Hastilow.

Woodrum et al in view of Whalen et al fail to teach the use of a single die for forming a core having a configured internal cooling passage. However, Hastilow (col. 3, lines 56+) teaches teach the use of viewing aperture or slots defined in a CAD data file and providing the CAD data file into a sterolithography machine for the purpose of effectively producing internal cooling passage in an investment cast airfoil. It would have been obvious to one having ordinary skill in the art to provide Woodrum et al in view of Whalen et a sterolithography machine having the CAD data file for forming the single die and producing a core having a configured internal cooling passage as taught by Zoia et al in order to effectively produce an internal cooling passage in an investment cast airfoil.

Response to Arguments

7. Applicant's arguments filed on September 17, 2004 have been fully considered but they are not persuasive. Applicant argued in the remarks (see pages 8) that Whalen et al fail to teach the use of a particular configuration for the cavity. However, either Klug et al (col. 4, lines 44+) or Cooper et al (col. 9, lines 7+) teach the use of the particular configuration for the cavity for the purpose of effectively forming cooling channels within a shell-molded turbine engine blade. Therefore, it would have been obvious to one having ordinary skill in the art to provide Whalen et al the use of the particular configuration for the cavity as taught by Klug et al in order to effectively form cooling channels within a shell-molded turbine engine blade. Further,

Applicant argued Woodrum et al fail to teach the use of a single piece sacrificial die. However, Whalen et al (col. 4, EXAMPLE 1, lines 15+) teach the claimed die (a RP mold in Fig. 3) comprising at least one cavity (see Figs. 1-2) for the purpose of effectively molding a ceramic core, wherein the said structure comprises a material including epoxy or silicone (fugitive polymer (col. 3, lines 24+) and can be selectively removed from molding a ceramic core by heating or chemical dissolution and the die is assembled in additive layers (slices) by lithographic process. Therefore, it would have been obvious to one having ordinary skill in the art to provide Woodrum et al the use of a single piece sacrificial die as taught by Whalen et al in order to effectively mold a ceramic core.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ing-Hour Lin whose telephone number is (571) 272-1180. The examiner can normally be reached on M-F (8:00-5:30) Second Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Dunn can be reached on (571) 272-1171. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

I.-H. Lin

11-10-04

KILEY S. STONER
PRIMARY EXAMINER

11/15/04